

10/588353

Serial No. Not Yet Assigned
Atty. Doc. No. 2003P15367WOUS

10/588353
SAP20 Rec'd UCR/10 03 AUG 2006

ABSTRACT

The present invention concerns a computer which determines a subsequent state of a steel volume, based on an instantaneous initial state of said steel volume and at least one volumetric surface, the temporary influence quantities acting on said steel volume, by resolution of an equation of thermal condition and phase change. The states include for at least one volumetric element of the steel volume, a local distribution in concentration of a alloy element mobile in the steel, the local proportions of the modeled phases of the steel and a quantity describing a local energy content of the steel. The phases comprise austenite and another phase, generally, ferrite or cementite. In the context of the change equation, the concentration levels of the mobile alloy element, which are located on either side of the phase boundary, between the austenite and the other phase are determined by resolution of the Stephan problem.